Three Paths to Mobile Victory:

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COMPUTERWORLD®

SPECIAL REPORT

CLOUD STORAGE ILLUMINATED

Applications are floating freely in the ether. Can you safely store your organization's data there, too? PAGE 16

JULY 6/JULY 13, 2009
VOL. 43, NO. 23 $5/COPY

Google discloses details of its long-anticipated operating system – and analysts say it could give Windows a run for its money. PAGE 6

Microsoft's oft-criticized SaaS plan gets a boost as two services firms agree to resell its hosted business software. PAGE 10

Cisco executives say they're closely watching Google's move onto the company's unified communications turf. PAGE 12

Qwest's CTO talks about what it's like having 'the coolest job you can get' and where the telecom industry is headed. PAGE 13

How to find an IT job during a deep recession. PAGE 40

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8 An analyst warns that a recently revealed **IE flaw** could be exploited in a **Conficker-scale attack. | Microsoft** prepares to open a 700,000-square-foot **data center** near Chicago.

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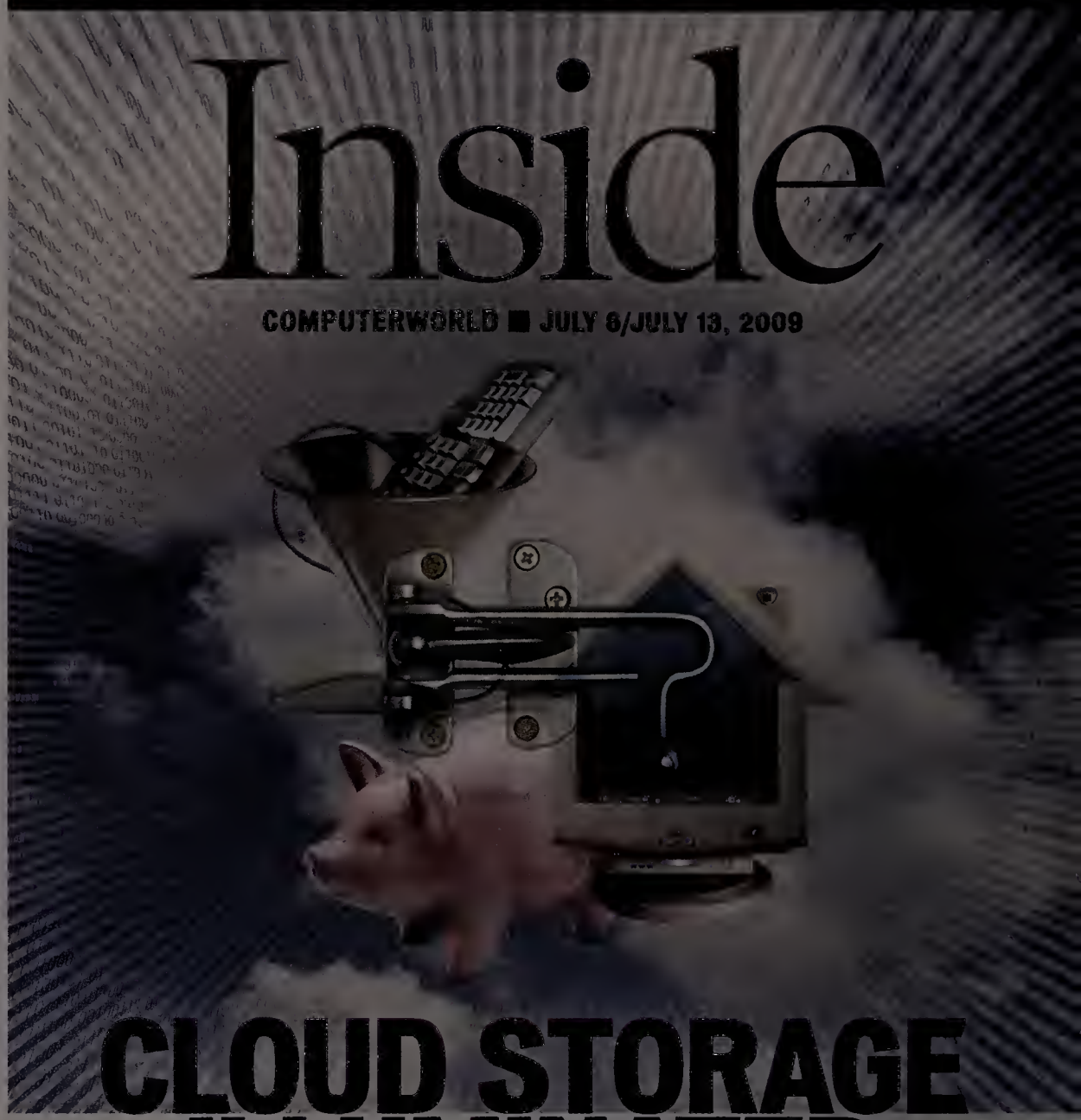

CLOUD STORAGE ILLUMINATED

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The sad state of storage management might create an opportunity for the cloud to serve as a secondary or, more likely, tertiary tier of storage, says James Damoulakis, CTO at GlassHouse Technologies.

VIKTOR KOEN ILLUSTRATION

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This Week Online

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The Lost NASA Tapes

A Macintosh Pro workstation and 40-year-old tape drives are helping to restore the original Lunar Orbiter tapes.

Rise of the Cybersquatters

Domain-name poaching can be costly for businesses in terms of lost revenue and damage to a brand's reputation. But trademark owners are pushing back.

You Say 'Shameful Secret,' I Say 'Privacy'

OPINION: Multinational companies may need to shift gears in the way they talk to employees about privacy, if they want to lock down their offshored data.

Energy-Efficient Servers Earn a Star – but So What?

The EPA's Energy Star program for servers is a good first step, most agree, but it measures energy use only under limited circumstances and doesn't include popular hardware types like blade servers – at least not yet.

Blog Spotlight

Google OS: 7 Thoughts

SHARON MACHLIS: By jumping into the operating system business, Google is taking on not only nemesis Microsoft but also the idea that applications are typically made to run on the desktop. Here are some musings on how this might change the desktop landscape.

London Stock Exchange to Abandon Failed Windows Platform

STEVEN J. VAUGHAN-NICHOLS: In September 2008, the London Stock Exchange collapsed because its Windows-based electronic trading platform, TradElect, completely failed. Now, under new leadership, the exchange will finally do away with its fatally flawed Windows system.

Context-Aware Mobility

How can context awareness paired with mobile devices change your world? Here's one way: The combination of technologies can make it easier for employees find goods in warehouses or retrieve office supplies buried in storage closets.

Windows Server 2008 R2

HANDS ON: Windows file classification lets administrators set up rules that apply and enforce classifications to data stored on the network, whether it's by file type, name, location or other criteria. Then Windows can automatically apply policies according to those classifications.

This Old PC

We show you how to make a tired old desktop PC better than new with a few easy and inexpensive upgrades.

SHARK BAIT

I Never Did That Again

A good program is nothing without an agreeable interface. But an error message that was supposed to be funny drove one technophobe to tears; she was convinced that the computer hated her.

ONLINE DEPARTMENTS

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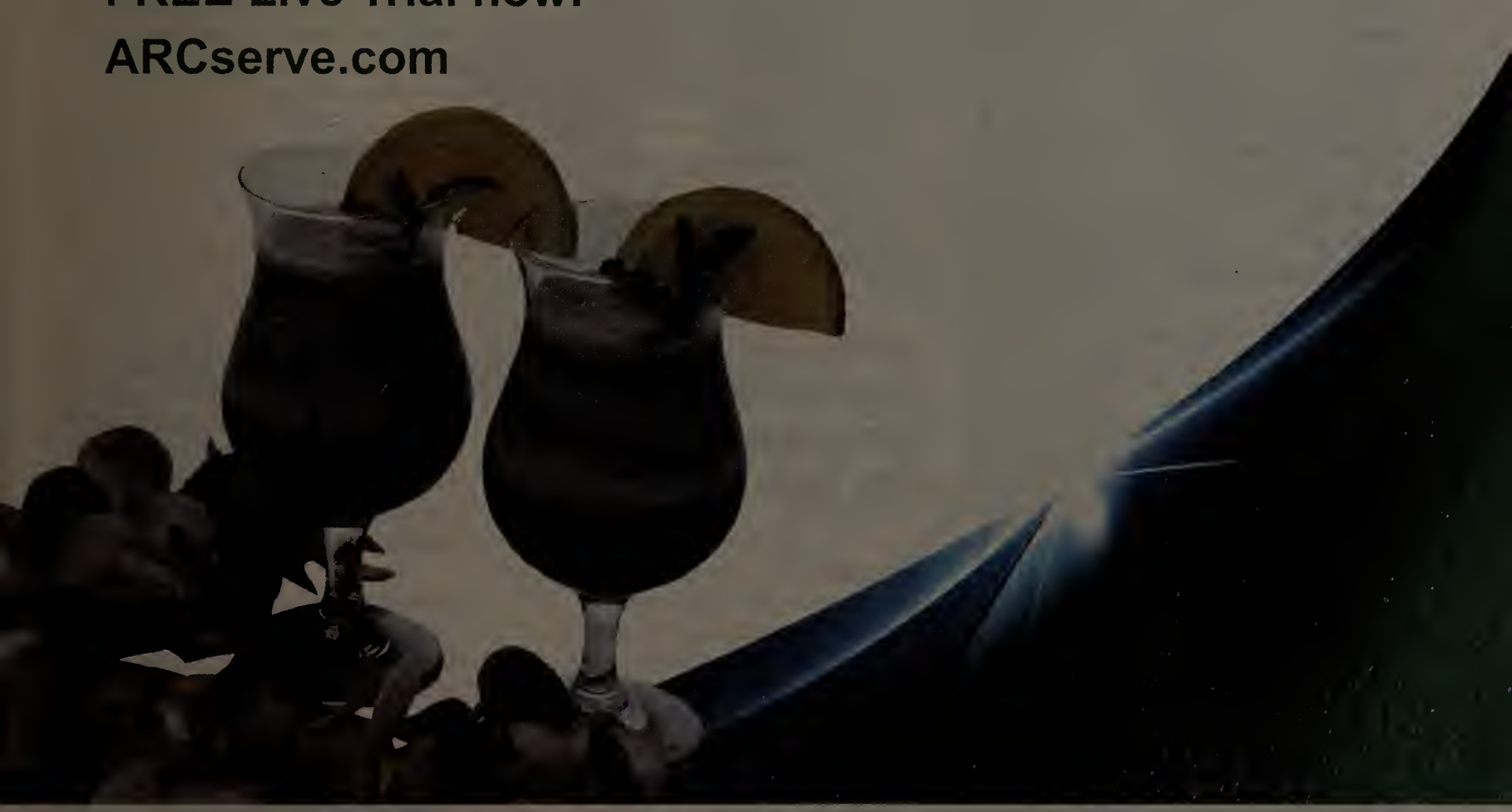

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■ LETTERS

What It Takes to Be Among the 'Best'

I did a quick analysis comparing the 2003 vs. 2009 rankings of *Computerworld*'s Best Places to Work in IT [June 8/June 15]. Here's what I found:

1. Only 27 employers from 2003 remain on list.

2. Biggest improvements in rank: Verizon (up 63 places, to No. 7); USAA (up 47); Principal Financial (up 46); General Mills (up 45); Marriott (up 39); American Fidelity (up 24); Aetna (up 20)

3. Biggest declines in rank: CDW Computer Centers (down 63 places); MasterCard (down 60); FedEx (down 40); Comerica (down 35); Cerner (down 30); Northern Trust (down 29); Discover Financial (down 22)

4. Of the 73 dropping off the list, manufacturing companies accounted for 20%, the largest single industry loss, by a good margin.

5. Only one company's ranking was unchanged: SoCal Edison.

6. Biggest surprises: Performance over time (for those appearing on both lists) appears to be industry-blind for both declining and improving companies: There is absolutely no advantage or disadvantage for any particular industry. However, the economic recession may have had an effect: 30% of those companies dropping off the list are in the manufacturing or financial industries; the figure is 43% if you include the insurance/real estate sector.

Bottom line: The "Best Places" distinction appears to be largely cultural: Either you have it or you don't. And it appears quite easy for employers to lose their bearings, i.e., stop doing what they were doing, and plummet in the rankings or fall off altogether. Or worse, fail to even apply to be considered year after year. A sign of corporate fatigue or even depression, perhaps?

The "best" seem to try harder than the rest to preserve their cultures and fortify their roots, no matter what. That's why they are the best.

■ **Bill Reynolds,** *analyst, Foote Partners LLC, Vero Beach, Fla., billr@footepartners.com*

■ ONLINE CHATTER

RESPONSES TO:

Layoffs Are Increasing Demand For Tech Freelancers

June 22, 2009

The premise of this article, that postings on Elance are up and therefore contracting is healthy, is bogus. Have you looked at the Elance.com jobs? Most of the contracts are so small that one would need to complete a minimum of several dozen per year to make a minimum wage living.

A recent job search using the key word "Linux" turned up just 60 hits, and 95% of them had budgets less than $1,000.

■ **Submitted by:** *Tim K*

If it weren't bad enough that tech workers are generally underpaid and overworked, now we have companies so cheap that they want us to work part time. It is enough to make one consider unionization.

■ **Submitted by:** *Anonymous*

I'd love to just work part time. At my job, we're all overworked, and they want more hours from us. Not all of us have more hours to give. Some of us were already past the number of hours that can be sustained long term.

■ **Submitted by:** *Anonymous*

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News Digest

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THE WEEK AHEAD

MONDAY: The Microsoft Worldwide Partner Conference opens in New Orleans. Also, a workshop on potential commercial implementations of the Protocol for Lightweight Authentication of Identity starts at NIST in Gaithersburg, Md.

TUESDAY: Microsoft is set to issue six updates, including three for "critical" Windows bugs. Also, Intel is scheduled to announce its second-quarter financial results.

THURSDAY: IBM is due to announce its Q2 financial results.

OPERATING SYSTEMS

Google Set to Wage OS War With Microsoft

GOOGLE INC.'S entry into the operating system business poses the strongest long-term threat in years to the dominance of Microsoft Corp.'s Windows software, according to analysts.

Google last week announced that it would launch its long-anticipated operating system, based on the open-source Linux kernel and built around its Chrome browser, sometime in the second half of 2010. The new Web-centric operating system will be dubbed Google Chrome OS.

Though analysts agreed that the Windows hegemony is safe in the short term, Google has the financial muscle, engineering might and industry clout to survive a long-term battle with an industry powerhouse like Microsoft.

"Google doesn't need an operating system to support its revenue stream," said Dan Olds, an analyst at Gabriel Consulting Group Inc. "They have lots and lots of revenue from their advertising bread and butter. That means they have [the] staying power that's critically important in this market."

Michael Silver, an analyst at Gartner Inc., said that Microsoft is unlikely to ignore the threat to Windows. "Microsoft, after all, is one of the more paranoid companies around," he said.

He added that Microsoft is unlikely to be adversely affected by Chrome OS in the short term.

Microsoft did not respond to a request for comment on the Google announcement.

Analysts did note that Google must stick to the long, complex grind of developing an operating system if it wants to be successful in that business.

Rebecca Wettemann, an analyst at Nucleus Research, said that in recent months, Google has shut down or stopped supporting several products, including Google Video, Google Notebook, the Jaiku microblogging service and the Dodgeball mobile social network.

"They pick something up, get excited about it and work on it until they find another shiny new object they want to play with," Wettemann said. "My feeling is that Google needs to stop announcing things and instead execute on completing them."

Nonetheless, the Chrome OS plan has attracted the support of several top PC vendors, including Hewlett-Packard, Lenovo Group, Acer and Asustek Computer.

— Sharon Gaudin and Gregg Keizer, with Juan Carlos Perez and Dan Nystedt of the IDG News Service

SOFTWARE

Google Peels Beta Label Off Most Online Apps

Google Inc. last week took the beta label off of several key Google Apps services, including Gmail, Calendar, Talk and Docs.

The full Google Apps suite targeting businesses was launched two years ago and has been in beta ever since. Some of the individual packages have been in beta even longer – Gmail has worn the tag for five-plus years.

In a blog post last week, Matt Glotzbach, product management director for Google Enterprise, acknowledged that the long beta period had led some users to assume that the services weren't ready for corporate use.

"We've come to appreciate that the beta tag just doesn't fit for large enterprises that aren't ready to run their business on software that sounds like it's still in the trial phase," Glotzbach said.

Dan Olds, an analyst at Gabriel Consulting Group Inc., agreed that the beta label likely hurt sales to corporate users, but he added that its removal puts more pressure on Google to avoid service shutdowns.

"If there were problems, Google could always fall back on the 'But it's a beta' line," he said. "They don't have that excuse anymore."

– SHARON GAUDIN

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SECURITY

Researcher Says IE Bug Could Spread Quickly

A CRITICAL ActiveX vulnerability used by hackers to exploit Microsoft Corp.'s Internet Explorer browser is a prime candidate for another Conficker-scale attack, security experts said.

On July 6, just hours after security companies reported that thousands of compromised sites were serving up exploits, Microsoft acknowledged the flaw in the ActiveX control that can be accessed using IE. The bug has been used by hackers since at least June 9.

Microsoft said it will issue a patch for the flaw on July 14.

The vulnerability "exposes the whole world and can be exploited through the firewall," said Roger Thompson, chief research officer at security software vendor AVG Technologies USA Inc. "That's better than Conficker, which mostly did its damage once it got inside a network."

Conficker exploited a Windows flaw that Microsoft had thought dire enough to fix outside its usual update schedule in October 2008. The worm exploded into prominence in January, when a variant infected millions of machines that remained unpatched.

Microsoft confirmed the latest flaw shortly after security researchers at Danish firms CSIS Security Group AS and Secunia said that thousands of hacks of legitimate Web sites over the July 4 weekend had exploited the bug.

The hackers took advantage of the bug to reroute users to a malicious site, which in turn downloads and launches a multiexploit hacker tool kit.

Two days after disclosing the bug, Microsoft admitted that members of IBM's X-Force threat research team had first reported the vulnerability to it sometime in 2008.

The X-Force researchers had uncovered the flaw in late 2007, and in December of that year reserved a number in the Common Vulnerabilities and Exposures list of publicly known information security vulnerabilities.

One of the researchers, Alex Wheeler, now manager of 3Com Corp.'s TippingPoint DVLabs, declined to say exactly when the flaw was discovered, citing a nondisclosure agreement he had signed with his former employer.

A Microsoft spokesman didn't say why the flaw wasn't patched earlier.

"When we were alerted in 2008, we immediately started an investigation," the spokesman said in an e-mail to *Computerworld*. "As we wanted to be thorough, this took extra time to fully evaluate."

— *Gregg Keizer*

Short Takes

Sprint Nextel Corp. has awarded a seven-year network services contract to LM Ericsson Telephone Co. Under the agreement, valued at up to $5 billion, 6,000 Sprint employees will begin working for Ericsson later this year.

Adobe Systems Inc. said it will issue a patch to fix a flaw in its ColdFusion Web development software. The SANS Internet Storm Center said the flaw has allowed hackers to compromise a "high number" of Web sites.

Apple Inc. CEO Steve Jobs has returned to work after taking a six-month leave of absence due to medical issues. Jobs, a survivor of pancreatic cancer, underwent a liver transplant in April.

CORRECTION

In *Computerworld*'s June 8/June 15 "Best Places to Work in IT" package, the location of State Farm Mutual Automobile Insurance Co. (No. 24) was listed incorrectly. The company is in Bloomington, Ill.

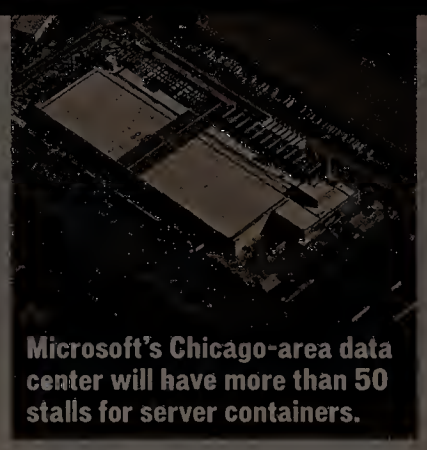
DATA CENTERS

Microsoft Opening Mall-Size Data Center Near Chicago

MICROSOFT CORP. next week plans to flip the switch to open a 700,000-square-foot data center in Northlake, Ill., less than three weeks after opening a 300,000-square-foot facility in Dublin.

Together, the data centers will house hundreds of thousands of servers that will help support the company's new Bing search engine and other online services, Microsoft said.

The data center in Northlake, which is a suburb of Chicago, is slated to open on July 20. It will house containers that can hold 1,800 to 2,500 servers each, said Arne Josefsberg, Microsoft's general manager of infrastructure services, in a blog post.



Microsoft's Chicago-area data center will have more than 50 stalls for server containers.

The Illinois facility will include more than 50 parking stalls for the shipping containers, which Microsoft said can be wheeled in as needed and installed in hours. The facility's second floor will have server racks.

The Dublin facility, which isn't using containers, opened on July 1.

Josefsberg said both data centers include multiple features that promote energy efficiency. For example, the Dublin facility makes "extensive use of outside air" for cooling, while the containers used in Chicago "will help us realize new advancements in power efficiency," he said.

– PATRICK THIBODEAU

STORAGE

EMC Wins Data Domain, Bests NetApp With $2.1B Bid

© FOTOLIA / FRANCK BOSTON

EMC CORP. on July 8 finally won its battle to acquire data de-duplication vendor Data Domain Inc., agreeing to pay $2.1 billion in cash.

The deal came just a day after EMC countered rival NetApp Inc.'s $1.9 billion bid for Santa Clara, Calif.-based Data Domain, which must now pay NetApp a $57 million deal-termination fee; the EMC deal doesn't stipulate such a penalty.

Sunnyvale, Calif.-based NetApp had started the takeover battle in March with an offer of $1.5 billion in cash and stock.

Steve Duplessie, an analyst at Enterprise Strategy Group in Milford, Mass. predicted that implementing the merger will be more difficult for EMC than its earlier acquisitions of VMware Inc. and RSA Security Inc.

Each of those companies, he said, provided EMC with products in new categories, and they are still operated as separate divisions. "I could make the argument that this will be harder because the [Data Domain] technology is nearer and dearer to EMC's core," Duplessie said.

In a statement, EMC said it expects the Data Domain technology to help it expand its next-generation disk-based backup and archive product offerings.

Jay Kidd, chief marketing officer at NetApp, said EMC's final bid surpassed what his company was willing to pay, and he contended that EMC significantly overpaid for Data Domain.

"You never want to judge the level of sanity of your opponent," Kidd said. "I think it will be a challenge for EMC to realize the ROI at this price."

Robert Stevenson, an analyst at TheInfoPro Inc. in New York, said that the deal should pay off for EMC over the long term as IT managers turn to de-duplication technology to help reclaim unused storage capacity.

— Lucas Mearian

BETWEEN THE LINES *By John Klossner*

The Emulex Corp. board of directors rejected Broadcom Corp.'s revised $925 million purchase offer. Broadcom said it is dropping all efforts to acquire Emulex.

Steven Sinofsky, a 20-year Microsoft Corp. veteran, was promoted to the new position of president of the company's Windows division. Sinofsky had been senior vice president of the Windows engineering group.

The last slide rule was manufactured. The once-common tool became obsolete after the invention of the hand-held calculator.

Global Dispatches

Pricing Woes Force Dell Moves

TAIPEI – Two pricing snafus on Dell Inc.'s Taiwan Web site forced the company to apologize to customers last week and quickly move to settle a probe launched by the nation's Fair Trade Commission.

The first error listed the price of a 19-in. LCD monitor at 500 New Taiwan dollars ($15.26 U.S.), far below its regular price of 4,800 New Taiwan dollars ($146.46), on June 26. Just over a week later, the site offered Dell Latitude E4300 laptop PCs for 18,500 Taiwan dollars ($563.40), less than one-third the regular list price of 69,000 Taiwan dollars ($2,101.34).

Dell said it has temporarily closed its online store in Taiwan and is offering consumers who ordered mispriced laptops a coupon for 20,000 Taiwan dollars ($605.40).

Dan Nystedt,
IDG News Service

Infosys Exec to Head New Indian Federal Agency

BANGALORE, India – Nandan Nilekani late last month resigned as co-chairman of Infosys Technologies Ltd. to head up a newly created Indian government agency charged with creating a unique identification and smart-card system.

Nilekani will be minister of the Unique Identification Authority of India, which will oversee a new system for delivering subsidized products and other benefits to India's poor.

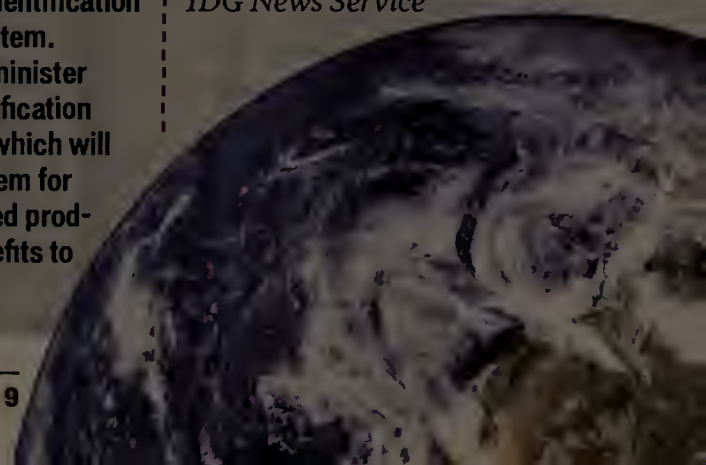
Nilekani was CEO and managing director of Infosys from March 2002 to June 2007.

John Ribeiro,
IDG News Service

BRIEFLY NOTED

LM Ericsson Telephone Co. CFO Hans Vestberg will take over as the company's CEO on Jan. 1, succeeding Carl-Henric Svanberg, who is resigning to become chairman of London-based BP PLC. Svanberg will continue to hold a seat on Ericsson's board of directors after his departure from the Stockholm-based company.

Mikael Ricknäs,
IDG News Service



Services Firms Boost Microsoft's SaaS Plans

CSC and Azaleos agree to resell the vendor's hosted BPOS offerings. By Eric Lai

MICROSOFT CORP.'S late move into the hosted software business gained some headway this month when two outsourcers — Computer Sciences Corp. and Azaleos Corp. — agreed to resell its Business Productivity Online Suite (BPOS).

Analysts said the agreements could portend a gradual acceptance of Microsoft's "software plus services" plan, which has long been dismissed by rival cloud computing vendors as the rear-guard strategy of a doomed incumbent.

BPOS, which includes hosted versions of Microsoft Exchange, SharePoint, Office Communicator and Live Meeting, was unveiled last fall.

Both Falls Church, Va.-based CSC and Seattle-based Azaleos plan to offer the BPOS services in addition to their more traditional businesses of providing outsourced management of e-mail, messaging and collaboration tools that companies run in-house.

Michael Osterman, an analyst at Osterman Research Inc. in Black Diamond, Wash., said he expects that more services firms will start adding software-as-a-service products like BPOS to their arsenals.

"BPOS is clearly picking up steam, and I think we'll see more hybrid messaging vendors in the fairly near future," Osterman said.

While most large organizations may be hesitant to "migrate tens of thousands of on-premises users to a hosted model, [many also have] lots of users at smaller locations" where hosted services could make sense, he said. "This would apply to just about every insurance company, realty company, bank, brokerage, retailer — we see lots of them moving toward a hybrid model."

EXPANDED OFFERINGS

Brian Boruff, vice president of cloud computing at CSC, noted that by adding the Microsoft suite, his company can now offer users access to three products: BPOS applications hosted by Microsoft; BPOS hosted within CSC's Trusted Cloud Services, with upgraded security that adds 20% to 40% to the price tag; and the company's existing Exchange and Lotus Notes e-mail management services.

CSC will be the master data administrator and will provide all Level 1 and 2 support for both the Microsoft- and CSC-hosted offerings, Boruff added.

CSC plans to sell subscriptions to the Microsoft-hosted version of the BPOS suite for $15 per user per month.

Azaleos, a provider of remote management services for on-site Exchange servers, last week announced plans to resell the BPOS services, allowing its customers to mix and match on-site and online messaging services.

Azaleos, which has 180,000 Exchange accounts under management at 150 customer sites, hopes that offering BPOS as a value-added package can help it woo more midmarket and enterprise customers, said Scott Gode, vice president of product management and marketing at Azaleos.

So far, he said, IT managers are interested in discussing hosted options but are mostly hesitant to switch from on-site messaging and e-mail systems. "Pretty much every RFP we're involved in, Microsoft is in there with BPOS," Gode said. "All of the CIOs are considering and looking at it, but they are unsure about jumping in with both feet."

Bill Pray, an analyst at Midvale, Utah-based Burton Group, said moving to support hosted services presents challenges to services companies like CSC and Azaleos.

"Azaleos' competency has been the management of on-premises systems," Pray said. "This offering is management of a different kind and requires brokering a relationship and technology needs between the customer and Microsoft. It takes a different set of skills and practices that Azaleos will need to develop."

Nonetheless, Boruff, a longtime Microsoft executive who joined CSC earlier this year, said he expects the addition of BPOS to the CSC product line to help the firm better compete with rivals like Electronic Data Systems Corp., Northrop Grumman Corp. and IBM in the large-enterprise and government markets.

Boruff also noted that CSC has already announced plans to offer Windows Azure, the cloud operating system under development at Microsoft, and that it is talking to IBM and Google Inc. about possibly reselling the former's LotusLive service, as well as the hosted Google Apps suite.

CSC and Azaleos are among but a few companies that have so far agreed to resell or widely use BPOS.

Last month, Paris-based Atos Origin SA agreed to resell BPOS, and in March London-based GlaxoSmithKline PLC signed a deal to migrate 100,000 employees from Lotus Notes to BPOS. ■

> **"This offering is management of a different kind and requires brokering a relationship and technology needs between the customer and Microsoft. It takes a different set of skills and practices that Azaleos will need to develop.**
>
> **BILL PRAY,** ANALYST, BURTON GROUP

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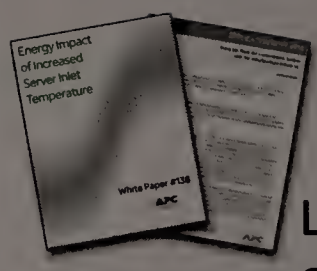

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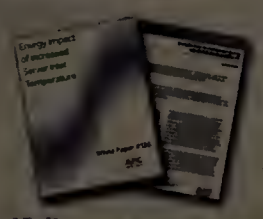

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GOOGLE'S Unified Tools POSE A THREAT TO CISCO

The Internet search leader is beefing up its communications tool offerings. By Matt Hamblen

OFFICIALS AT Cisco Systems Inc. say they are closely watching Google Inc.'s aggressive foray onto their unified communications turf and plan to respond quickly by boosting the capabilities of Cisco's offerings.

In fact, analysts said Cisco's announcement late last month that it plans to offer at least some pieces of its IP voice technology as a hosted service could be viewed as a direct response to Google's recent move to start limited release of its Web-based Google Voice and Google Wave communications tools.

During a press briefing at the Cisco Live user conference in San Francisco late last month, Doug Dennerline, Cisco's senior vice president of collaboration software, acknowledged the challenge from Google and said his company is set to "invent and reinvent" its unified communications offerings.

Analysts said that the Google Voice Internet telephony service, now available to early users by invitation, and Google Wave, a hosted collaboration and communications service released to developers early this month, may pose long-term problems for companies like Cisco and Microsoft Corp.

The Google products could provide users with a less expensive common platform for delivering messaging, voice and video services to consumers and office workers, they said.

The Google Voice service was launched in March for a limited customer base: users of its predecessor, Grand Central, a service the search vendor had acquired almost two years earlier. Late last month, Google began inviting selected new users to the service, which has attracted widespread attention for its call-screening capabilities and its ability to provide a single phone number for multiple devices.

The company did not say when the free service will be generally available.

Google Wave, which has been in development for about two years, promises to give users a single platform for accessing e-mail, instant messaging, blog, wiki, multimedia management and document-sharing tools. Google also hasn't said when Google Wave will be widely available.

Though the Google offerings appear to be aimed primarily at consumers, they could quickly become attractive to small businesses, and eventually to large companies, if the products can overcome the privacy concerns raised by storing phone messages and other confidential data on third-party systems, analysts said.

Zeus Kerravala, an analyst at Yankee Group Research Inc., said it could take some time for Google's product features to match those of Cisco, Microsoft and voice-switching vendors like Avaya Inc. or Siemens AG. But he predicted that over the "long term, Google will have a significant role" in the business.

"Google has the mind share and capital resources to be as big a threat as it desires to be," he added.

Some observers said that Google's maneuverings could hurt Cisco in particular as it tries to expand into the consumer market, long a Google stronghold.

For example, Cisco in March announced plans to buy Pure Digital Technologies Inc., maker of the Flip handheld camera used mostly by consumers. Cisco officials have also disclosed that the company is developing a consumer version of its TelePresence videoconferencing system.

"We think video is going to be very key in driving the next level of collaboration — Internet video, desktop video and consumer TelePresence," said Padmasree Warrior, Cisco's chief technology officer.

Cisco officials released few details of the company's plan to offer some virtual voice services, though Warrior said they will probably be offered through its service provider customers.

Kerravala said it's clear that the new service has "got to be competitive" with Google Voice. ■

■ THE GRILL

Pieter Poll

Qwest's CTO talks about what it's like having 'the **coolest job** you can get' and outlines where the **telecom industry** is headed.

Dossier

Name: Pieter Poll

Title: Chief technology officer

Organization: Qwest Communications International Inc.

Location: Denver

Favorite technology: "The home PC."

Favorite book: *The Big Year: A Tale of Man, Nature, and Fowl Obsession*, by Mark Obmascik

In high school, he was known for . . . "Being a geek."

Something people don't know about him: "If you couldn't guess from my favorite book, I am a somewhat serious birder and have a goal to see all of the roughly 700 species of birds in North America. Birding dovetails nicely with my nature photography and fly fishing hobbies."

Pieter Poll is chief technology officer at Qwest Communications International Inc. in Denver, which serves business customers nationally and residential customers in 14 western states, providing them with telephone, high-speed Internet, fiber-optic Internet and DirecTV services. The company is also acting as an agent for Verizon Wireless services. Poll talked about his career and the directions Qwest is taking.

You studied math in college and you have a graduate degree in physics. As CTO, you are now responsible for technology strategy at Qwest. What type of education do people in your line of work need?
My bachelor's is in math and physics, and my doctorate is from Cornell in physics. So that meant making a transition from theoretical physics into the telecom lab at Bell Labs. There was a logical segue between the way you approach problems in physics and with problems in the lab. The first graduate degree, the master's, is not there to teach you material. It teaches you to think critically, and that's a key skill we need in any technology industry. People are not just turning a crank and answering a problem. They are thinking critically. Also, as a technologist, you

“Qwest has flourished, if anything, in this economy. It’s an opportunity that’s probably true for all telecom.

need to learn about business as well, since you deal with business matters.

What is the hardest part of your job? The hardest part is ensuring you are building consensus, or support, for what you are proposing, because there are always other points of view. There’s also always tension between what is right strategically in the long run and hard to do in the short run because of finances and economics.

Has the recession been frustrating in your sector? Actually, the recession has not been frustrating for Qwest. As a company, we have grown revenue in the business space, and revenue in the consumer and wholesale part was as planned. The wholesale channel business is focused on making margins, since revenue is easy to get, but we want to make sure it’s profitable. Qwest has flourished, if anything, in this economy.

It’s an opportunity that’s probably true for all telecom. There are challenges facing the service industry in telecom, yes, and some companies are diminishing a bit, but it’s not the same as some other industries, where the bottom has been hit.

So, what’s the exciting part of your work? I’ve said it many times, that being CTO has got to be the coolest job you can get. It’s hard to imagine a job where you influence strategy while working on technical problems. You sit with suppliers and customers, and you are on the cutting edge of problems in the industry. For a person with a science and engineering background, you love those things. You joke at times that you wouldn’t take pay because it’s fun.

Can you briefly describe your technology strategy at Qwest? We have structural challenges around how to provide broadband access and broadband speeds for consumers in a portable fashion. Qwest is very active in service convergence, and we have a philosophy of partnerships to improve the customer experience with Verizon Wireless and DirecTV, along with broadband from Qwest.

You are getting out of the mobile virtual network operator business. How is that going? The MVNO exit is going very well for Qwest and is working on a definitive timeline. It gets hard to support diminishing subscriber numbers on the existing arrangement, but we’re making it painless. We’re thrilled to work with Verizon Wireless, and they have an awesome network. Basically, Verizon Wireless is a partner, and we’re reselling Verizon Wireless service in our 14-state territory. It is absolutely their wireless network inside the Qwest local territory, and they work with Qwest to backhaul the wireless with specific assets.

In the past, Qwest built wireless on CDMA in medium to large cities in our 14 states where we have local phone access. But it was sold, some to Sprint and some to Verizon and other CDMA carriers.

You also now offer free Wi-Fi access to broadband customers, including some businesses? Yes, we also announced in May a Wi-Fi arrangement, powered by the AT&T Wi-Fi network, available to Qwest high-speed Internet customers at 17,000 nationwide hot spots. It’s part of a broader look at wireless as a start to make user experiences better.

What are your plans for WiMax and LTE? Qwest and the vast majority of carriers are strongly behind LTE. We don’t do WiMax for backhaul but have some trials of it and could certainly do it.

How is Qwest able to be successful nationwide with business customers, including large companies? Qwest participates nationwide for business customers, and we have invested in awesome nationwide technology that’s recognized by the Networx [federal communications services contract]. IT folks and CIOs are interested in scaling costs and want technologies that help with emerging problems such as security and how to start to deal with that. Also, a lot of folks are struggling with cloud computing.

Verizon and others are offering cloud computing services. What about Qwest? Qwest is developing a full portfolio. Cloud computing means different things to different customers, but we are very good in reliability and scalability. Obviously, if you are five guys running a business in a garage, things that the cloud offers you at a platform or service level are very different from a large company.

Maybe it’s my East Coast orientation, but it surprises me and some others that Qwest can serve a business nationwide as you advertise it can. I think that people get that, and our revenues show that is a growing business for us, whereas for most competitors, it’s not.

— Interview by **Matt Hamblen**

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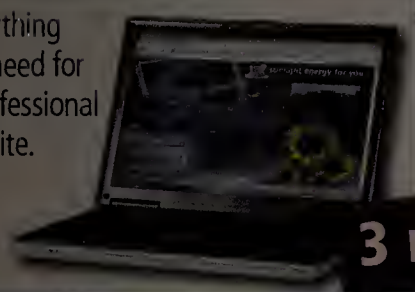

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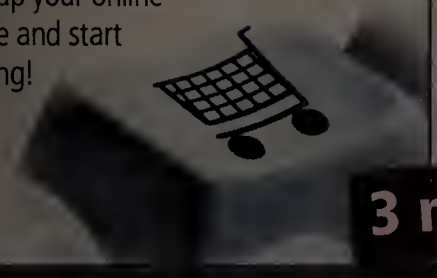

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CLOUD STORAGE

A bird's-eye view of the technology and the before storing your data in the cloud. BY JULIA KING

CLOUD STORAGE may be creating a stir these days, but big enterprise users aren't buying in — at least not yet.

Meanwhile, vendors are in what one provider calls "education mode," explaining to CIOs, IT managers and other IT buyers that they can save a lot of money by floating their data in public and private clouds.

The one thing both groups seem to agree on is that cloud storage will eventually take off. After all, it's technically feasible, it's cheaper than traditional data storage, and it's becoming more and more secure.

"I look at cloud adoption a little like I look at Linux adoption 10 years ago," says John Engate, chief technology officer at San Antonio-based Rackspace Hosting Inc. "Adoption didn't happen overnight. It came in the back door. The system administrator or developer who did work on the weekend brought in the Linux application he built and showed it around on Monday like a science project. It took a while for people to realize it's a viable way to do things."

Cloud storage is a lot further along than a science project. But is it right for part, or even all, of your organization's data? Here are answers to five key questions that will help you decide whether you should head for the cloud.

VIKTOR KOEN ILLUSTRATION

1. WHAT IS CLOUD STORAGE, AND HOW DOES IT WORK?

Ask a dozen people and you'll get a dozen different definitions. In a nutshell, cloud storage is a utility-type service that provides multiple users or "tenants" access to a shared pool of storage capacity, which is accessed over an Internet connection. Storage clouds are scalable, and they can easily expand or contract according to customer needs.

2. WHAT'S THE DIFFERENCE BETWEEN A PUBLIC CLOUD AND A PRIVATE CLOUD?

The public cloud is a pay-per-use storage utility. All components sit outside of the customer's firewall in a shared infrastructure that is logically partitioned, multitenant and accessed over a secure Internet connection.

Public cloud storage providers, such as Amazon.com Inc. with its Simple Storage Service, typically charge a monthly usage fee per gigabyte of storage plus an additional bandwidth fee for transferring data to and from the cloud. Public cloud customers require no physical storage hardware or any special in-house technical expertise. Rather, the cloud storage service provider manages the storage infrastructure, pooling its capacity to accommodate the needs of multiple customers. Users typically access their publicly stored data via an Internet connection.

A private storage cloud is usually built behind a company's firewall, using hardware and software owned or licensed by the company. All of a company's data remains in-house and is fully controlled by in-house IT staffers. Those staffers can pool storage capacity to be shared across different departments or used by different project teams within the company, regardless of their physical locations. As with public clouds, storage capacity can quickly and easily be increased by adding servers to the pool. ParaScale Inc.'s Cloud Storage product and Caringo Inc.'s CAStor are two examples of applications that can be used to set up private cloud storage systems.

Engate describes the private cloud differentiation this way: "The user is still in the IT business, the software configuration business, the storage management and support business, and the data center business. You still have to have all of those resources."

There is one exception. When a private storage cloud is created by carving off a piece of a public storage cloud for one customer's exclusive use. Users pay a premium for private cloud storage, much like one pays a higher rate for a private room in a hospital.

Essentially, "the difference between public and private cloud storage comes down to the way you connect," says Mike Maxey, director of product management at ParaScale, a Cupertino, Calif.-based vendor whose software was designed to aggregate disk storage on multiple standard Linux servers to create a single, scalable, self-managing private storage cloud.

"If you're connecting over a wide-area network and sharing the resources with other customers, it's a public cloud. This makes sense if you're a highly distributed company and creating applications but don't have a shared infrastructure," Maxey explains. "It's also good if you're putting out transient data, like movie trailers, that might run for five months. Temporary storage in the [public] cloud makes sense."

Predicted percentage of IT infrastructure that will be purchased as a service by early adopters by 2011.

SOURCE: GARTNER INC.

3. IS CLOUD STORAGE FOR ALL TYPES OF DATA?

No. Cloud storage best handles large volumes of unstructured data and archival material, such as credit card and mortgage applications or medical records. For now, public clouds can't reliably handle highly transactional files or databases that require consistently fast network connections. Any kind of online transaction processing is a no-go.

Cloud storage also isn't an appropriate choice for Tier 1, Tier 2 or block-based data storage, says Jim Ziernick, president and CEO of San Diego-based Nirvanix Inc. "If someone is trying to replace a SAN in supporting a transaction-processing system like CRM, we're not appropriate. Even if we did do block-level storage, the latency of the Internet would cause a noticeable delay," he says.

"What we can do with cloud storage is give users nearly the access that they have with [network-attached storage]," he adds.

Data backup, archiving and disaster recovery are three likely uses for the cloud, says Engate. "The cloud is for any kind of large-scale storage need with any kind of static-type data," he says. "You don't want to store a database in the cloud, but you might store a historic copy of your database in the cloud instead of storing it on very expensive SAN or NAS technology."

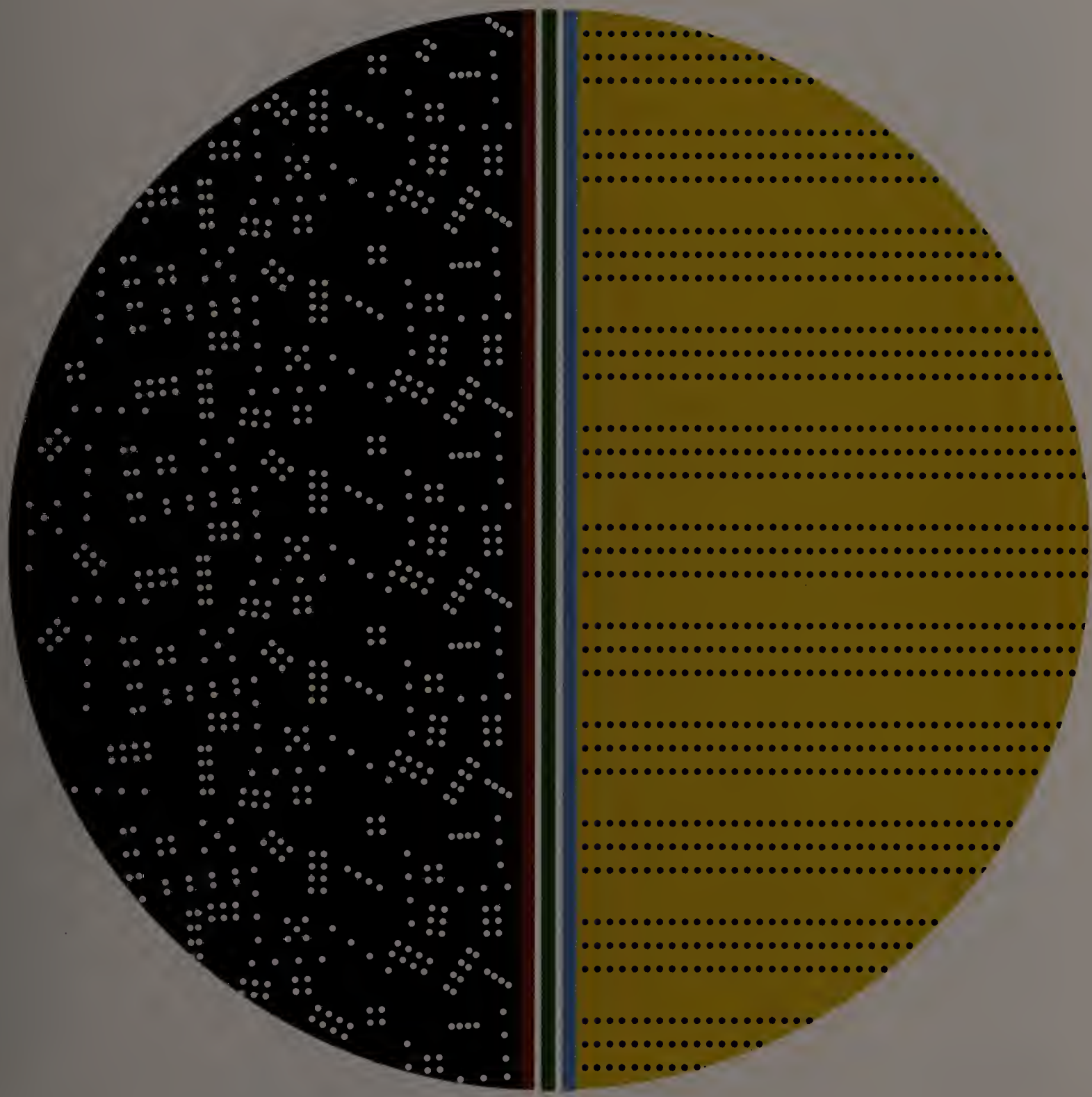
"A good rule of thumb is to consider cloud storage only for latency-tolerant applications," says Terri McClure, a storage analyst at Enterprise Strategy Group in Milford, Mass. "Backup, archive and bulk file data would all do

Continued on page 27

POWER Players

A SAMPLING OF CLOUD STORAGE VENDORS AND THEIR OFFERINGS:

A smarter planet needs smarter technology.

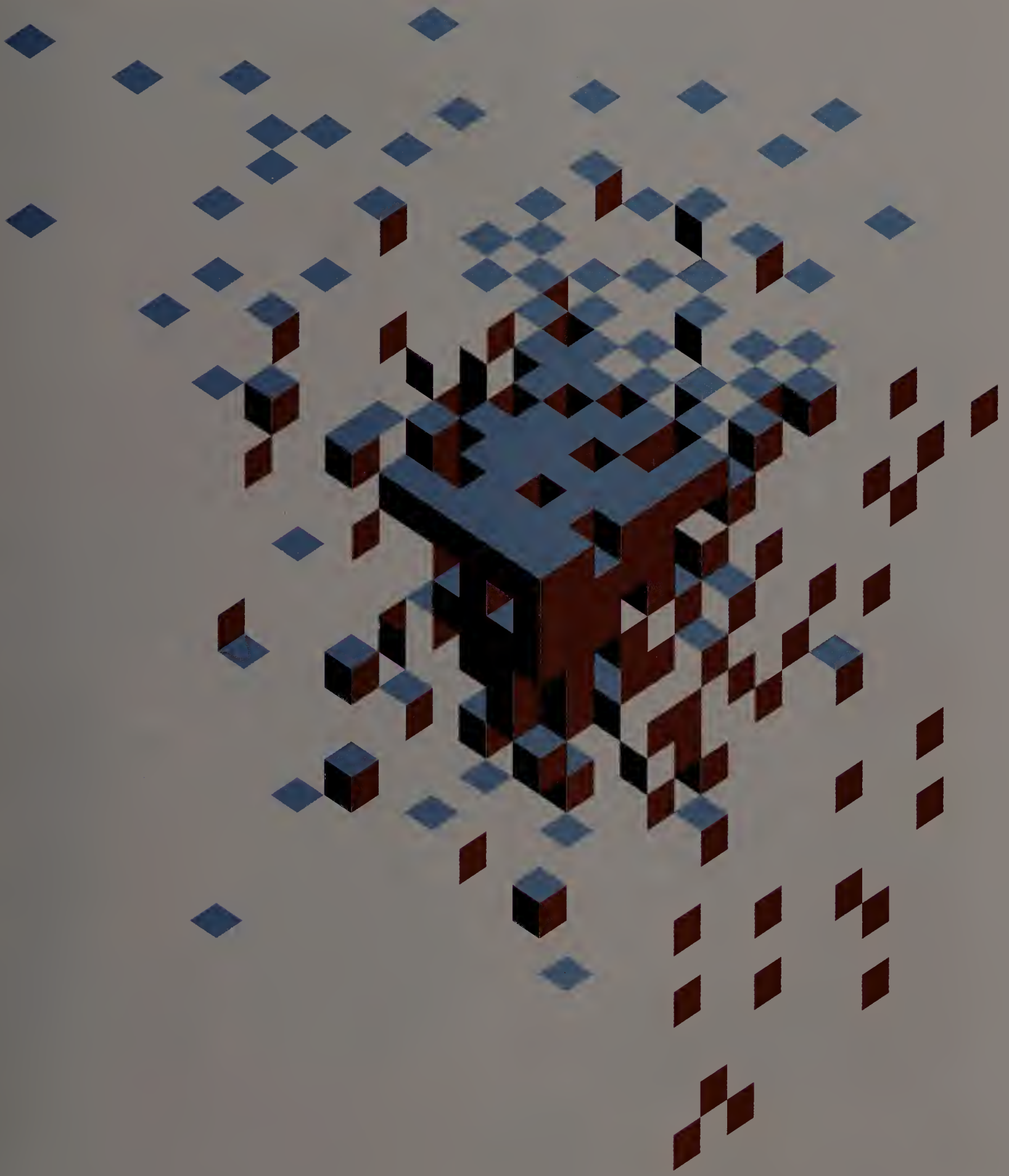


A smarter approach to infrastructure.

The datacenter used to equal IT and nothing more. But on a smarter planet, intelligent devices connected to powerful service management systems are redefining the role of the infrastructure at the core of the enterprise. The datacenter is becoming the nervous system of the entire business—the center of a more dynamic infrastructure that can sense and respond to change—whether it's assembly lines that understand how to adjust to changing needs or power grids that match supply and demand. IBM has already helped customers achieve this vision—by improving service, increasing flexibility and reducing operating costs by as much as 50%.

A smarter approach to information.

Companies today are struggling to manage massive amounts of information—to free their data from application-centric silos so they can make use of it. An Information Agenda from IBM gives you an overarching strategy to get real value from your information systems so you can make use of your data to make decisions faster and with greater confidence. This insight allows you to optimize your processes, predict market changes and act on new opportunities. Banks can better manage their financial risk. Retail companies can crystallize trends. Manufacturing companies can identify better production techniques. It's a way to make information work for us, instead of vice versa.



A smarter way to deliver services.

An intelligent service management system is the foundation of a more dynamic infrastructure, allowing you to tightly integrate your business and IT infrastructures. IBM's approach to service management can help you extend greater visibility, control and automation through all of your services. Inside and out. Top to bottom. We're already helping companies all over the world—20 of the 20 top telcos, 10 of the 20 biggest utilities and 7 of the 10 largest automotive manufacturers—reach beyond the datacenter to deliver quality service and respond quickly to the demands of a smarter planet.

A smarter way to collaborate.

Today, businesses and their employees are increasingly working beyond their walls—with partners, suppliers, customers and remote employees. That's why IBM is actively incorporating new tools, like social software, wikis and presence awareness throughout its collaboration portfolio—as well as new ways of accessing these tools through the cloud. Cloud-based tools like LotusLive™ let your people work with whom they want to work while offering your organization enhanced productivity without the cost and complexity of additional infrastructure. So you don't have to tear down your walls to reach beyond them.

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Continued from page 18

well in the cloud, where subsecond response time is not a requirement." On the other hand, databases and any other data that is "performance-sensitive" aren't suited for cloud storage because of latency, she notes.

But before moving any data to a cloud, public or private, users need to address a more fundamental question, says Mark Tonsetic, program manager at The Corporate Executive Board's Infrastructure Executive Council. "If you go to cloud storage, does it solve the problem of understanding where and why storage growth is out of control and where the point of value is [in storing a particular set of data] in the entire end-to-end business process? Just moving the technology to a cloud is not an optimal solution," Tonsetic says.

4. WHO IS USING CLOUD STORAGE TODAY, AND HOW ARE THEY USING IT?

Start-ups and new Web 2.0-based service providers, such as San Francisco-based Cloudize Inc., are among the biggest users of cloud storage, at least for the time being. Cloudize bills itself as the first SaaS-based file collaboration tool focused on small to midsize enterprises. CEO Edwin Fu says the tool was designed to centralize all of a company's files in a cheap, scalable and collaborative way. One of Cloudize's Web 2.0-based applications lets users of Salesforce.com — the granddaddy of software as a service — store and share data, such as big sales presentations and video, in the public cloud. San Diego-based Nirvanix provides the public storage cloud behind Cloudize.

Fu, a former Salesforce.com employee, describes that company's users as "low-hanging fruit" when it comes to signing up cloud storage customers. "We picked the Salesforce.com audience because they're comfortable with SaaS and SaaS-based storage," he says. "They already have their most sensitive contact data in the cloud. What we're doing is taking the next step."

On the larger enterprise side, cloud storage customers are fewer and farther between. "We are in the very early stages of adoption. Typically, when we're talking to customers, we're talking with classic early adopters," says Nirvanix's Ziernick. These include strictly regulated financial services companies that are required by law to store client audio conversations and other large data files, and content delivery networks that store and then stream images, audio and video to customers. More and more, users within companies are tapping cloud storage for pilot projects and proof-of-concept initiatives, Ziernick says.

Schumacher Group, an emergency medicine management and staffing company based in Lafayette, La., stores a range of documents, including contracts and reports, on Salesforce.com's cloud platform, Force.com. It also houses all accounts receivable, general ledger and accounts payable data in a hosted PeopleSoft enterprise software system, and its employee benefit information on a hosted system from Workday Inc.

"We have over 50% of our processes living in the cloud currently," says CIO Douglas Menefee. "All are sizable data sets with thousands of transactions being performed on a daily basis," he adds. He anticipates that by the end of this year, 75% of the company's processes will be in the cloud.

5. DOES CLOUD STORAGE ELIMINATE THE NEED FOR IN-HOUSE TECHNICAL RESOURCES?

Public clouds remove the need for server and storage administrators, but not all technical resource requirements go away, according to ParaScale's Maxey. Many public cloud storage services use newer protocols, such as WebDav or REST, for access, he notes. If a customer's in-house applications don't support those protocols, the technical staff will need to make changes to code. Otherwise, Maxey says, "it's like being dropped in a foreign country and not knowing the language."

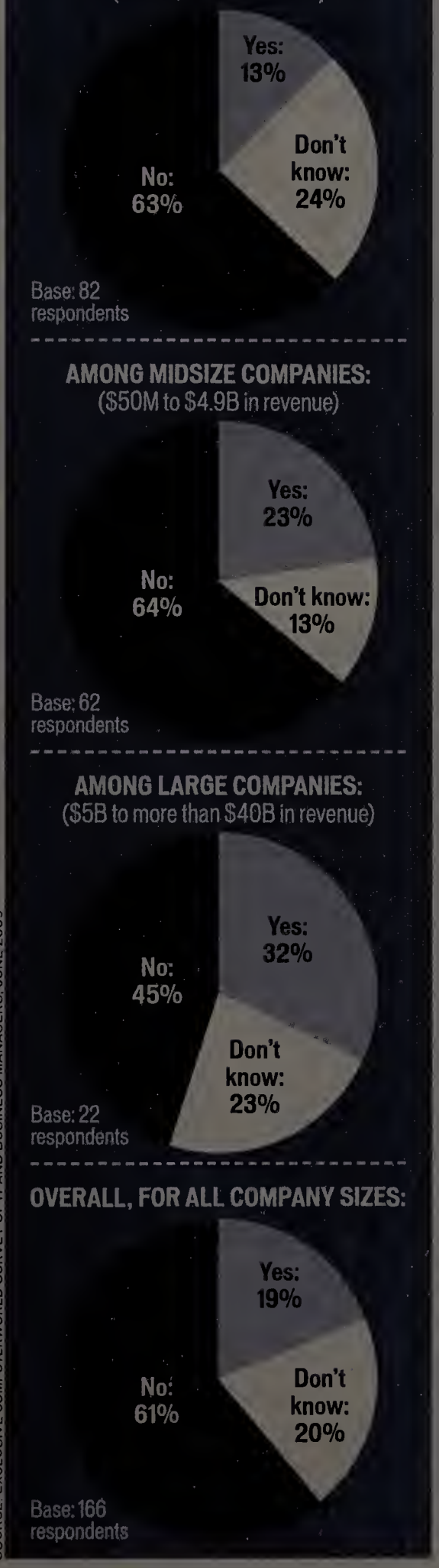
Newer software applications developed in a modular fashion will be easier to adapt for storage clouds, he says; older applications will be more difficult.

Eliminating IT staff was never the point for Rockville, Md.-based Forrester Construction Co. when it signed up with Iron Mountain for cloud storage service, says CIO Tom Amrhein.

"The real advantage," he says, "is the ability to align your IT resources to tasks that make a difference to the business." ■

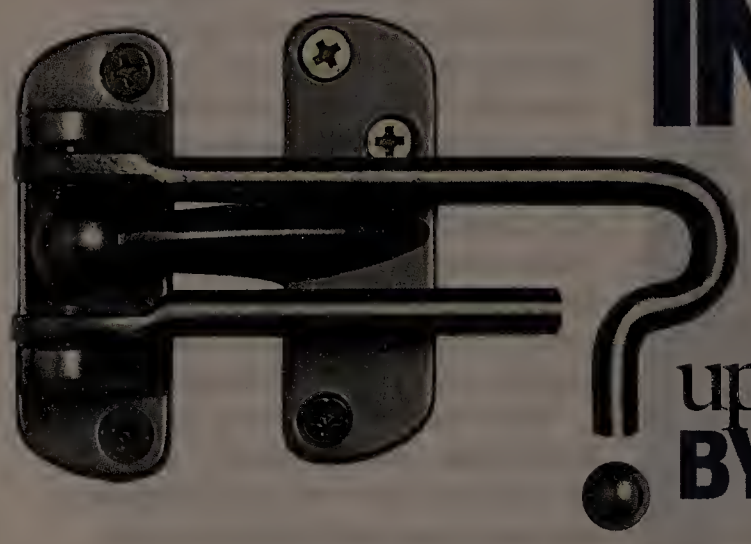
CREEPING TOWARD THE CLOUD

Do you expect to move your organization's storage to the cloud?



SOURCE: EXCLUSIVE COMPUTERWORLD SURVEY OF IT AND BUSINESS MANAGERS, JUNE 2009

Confidence IN THE CLOUD



IT managers are **CHARMED** by the concept but fear giving up **CONTROL** of data. Here's why.

BY ROBERT L. MITCHELL

LIZ DEVEREUX knows a thing or two about cloud storage. As director of IT storage and digital imaging at Banner Health, Devereux oversaw the construction of an internal 150TB storage grid. The grid delivers storage as a service to the Phoenix-based health care provider's network of hospitals and health care facilities in seven states, which use it as a repository for radiological images. But she would never entrust that data to an external storage service provider.

"I'm nervous about someone else controlling my data," Devereux says.

Cloud storage offers some enticing advantages. It's pay as you go, with no capital outlay and no need to buy extra equipment in anticipation of future storage demands. You scale storage dynamically and pay only for what you use. But you must trust your data to the cloud — and the vendor behind the service.

Few midsize or large businesses are willing to trust the cloud today, although some are experimenting. "There's a huge amount of interest," says Gene Ruth, an analyst at Burton Group. But, he adds, none of his firm's Fortune 100 clients is using a cloud storage service for live data today.

It's probably wise to proceed with caution, says James Damoulakis, chief technology officer at Glasshouse Technologies Inc., an independent IT consulting and services firm that focuses on enterprise data centers, storage and other elements of the IT infrastructure. "Cloud storage today is pretty much an early-stage concept," he says. Aside from a few heavyweights, like Amazon.com Inc.'s Simple Storage Service (S3) and Verizon Communications Inc.'s Online Backup and Restore service, most offerings come from small start-ups. "It's best suited for low-priority or low-access, low-touch kinds of applications, primarily file-based as opposed to block-based," says Damoulakis, who is a *Computerworld* columnist. But he says he does have clients that use services from Amazon as temporary expansion space for testbeds or marketing programs.

Joe Mildenhall, CIO at Apollo Group

Continued on page 30

Sunny Skies

Top four benefits of cloud storage:

1. It saves money.
2. It provides storage skills we don't have in-house.
3. It handles our peak demand times and volume spikes.
4. It eases staff resource needs.

Stormy Weather

Top four drawbacks of cloud storage:

1. It puts our data at risk.
2. It can't meet our regulatory/compliance mandates.
3. It costs more.
4. It can't meet our capacity needs.

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BUSINESS RISK LEADERSHIP

Continued from page 28

Inc., is taking baby steps into cloud storage. "We have a lot to lose. If we're playing, we're only going to play with the big guys," he says. The Phoenix-based for-profit educational institution is using Amazon's S3 to temporarily store papers that some of its 400,000 college students submit through the Apollo Web site.

But even with Amazon, Mildenhall will entrust only low-risk data to the cloud. For example, students can submit Word documents to the Apollo Web site, which runs the documents through a grammar-checking engine and then parks them in Amazon's S3 storage. When a student retrieves his document, the data is purged. "The major characteristic is that it's not very important storage to us," Mildenhall says.

So far, the integration with S3 has worked well. But Mildenhall is still wary. "If Amazon went down for two days, my opinion would change," he says.

FEELINGS OF INSECURITY

The most common storage-as-a-service offerings are online backup and archiving applications. Things have changed since the days of StorageNetworks, a company that couldn't make a go of hosted backup and closed its doors in 2003. The original idea behind StorageNetworks was outsourcing — providing a service that used the same storage frames that were in the data center, says Damoulakis. Now, many cloud storage services use low-cost, commodity storage in a distributed architecture. "We've advanced very far in virtualization, the Internet, distributed computing and the grid concept," he says.

Michael Peterson, president of Strategic Research Corp., launched a storage service provider in those early years and was a business and technology adviser to StorageNetworks. He says *cloud storage* is a very broad term that incorporates a variety of technologies and business models. For example, some service providers use distributed, commodity storage, while others might use traditional midrange or high-end storage frames. That means that it's important to understand what you're buying.

But there is a common theme: virtualization. "[Cloud storage] includes everything and is a virtualization model," Peterson says. Cloud is a catalyst for change, not a technology, and as such, it will bring about broader use of virtualized practices, he predicts.

Cloud storage service offerings range from basic file-based storage infrastructure services, like Amazon's S3, all the way up to storage-as-a-service applications. With the exception of start-up Zetta Inc., most vendors aren't pitching the cloud for primary storage.

In the business market, remote backup has always been the real driver for cloud storage, Peterson says. Nonetheless, most large businesses remain on the sidelines.

One of the biggest concerns IT organizations have with cloud storage is data security. Many cloud storage vendors offer encryption for data in transit and at rest. Some, such as Zetta, make encryption the default setting. That's important because in a storage cloud, your data might be on the same disks as data from other users, says Ruth. If another customer's data is raided by the FBI, for example, could yours go with it? "The laws are not sufficient to protect innocent parties whose data is on the same equipment," says Ruth. To address that, some vendors keep each customer's data on a separate disk. Zetta encrypts each customer's data with a different key.

Mildenhall says he feels confident that Amazon will be around for a while, but he still doesn't trust that the data will be. If he were to entrust business data to Amazon's storage service, he says he would need a mechanism to ensure that a copy of the data was replicated back to his data center. "I'm not willing to say that the copy of data in the cloud is the only copy I've got," Mildenhall says.

Fear of vendor lock-in is another concern. Every storage service provider has its own proprietary APIs. In some situations, the user might also want to define metadata associated with a data set, such as aging information or security parameters. But storage service providers handle that differently as well, says Ruth. "These services shouldn't require specially designed interfaces to make them work," he says. Vendors are just starting to work on standards to eliminate the problem.

The lack of common APIs would create problems if a storage service provider were to suddenly shut its doors — and that's a possibility when you're dealing with a start-up. "Once you get in bed with a service provider, you hope to heck they're not going to go out of business," Ruth says.

It's not how to get the data back that worries Manjit Singh, but whether he'd even have access to the data if the provider went belly up. "If it's bankrupt, the creditors might just come in and take the equipment, and they don't care what's on it," says Singh, vice president and CIO at Chiquita Brands International. He has yet to give cloud storage a try.

Rich Zoch is experimenting with Zetta's storage service at the University of Texas at Austin — but not for primary

Be

One way to trust the cloud is to own it. That's what Banner Health did when it created its own internal storage grid five years ago. "When we went to the grid, the word *cloud* didn't exist," says Liz Devereux, director of IT storage and digital imaging. But like an external cloud services provider, Banner's IT organization did have to build trust with its own customers – the hospital radiology departments its grid serves.

The first step in gaining their trust was to listen. Devereux says she worked closely with her internal customers to understand their requirements. "They trusted us to do the right thing," she says. The biggest worry was the idea of centralizing storage and not having local copies, rather than the concept of cloud storage itself, she says.

Devereux says she had to reassure the radiology staff that the system as designed had contingencies to make data available even in the event of a LAN, WAN or application outage. "That won't happen instantly, as it does in normal operation, but it still works and keeps patient care going," she says.

– ROBERT L. MITCHELL

storage. "It's a great platform to offload backup archives that are encrypted," says Zoch, senior systems administrator. But so far he has trusted the service only with dummy data. He says he plans to use it as a secondary storage pool for backups as an alternative to tape.

Zoch says he likes the fact that Zetta uses public key encryption that's compliant with Federal Information Processing Standard 140-2, but the university still might decide to encrypt the data itself before transmitting it. And since he's using Zetta only for secondary copies, he's not worried about getting it back if something happens on Zetta's end.

It might also be impractical to move large amounts of data from a cloud storage provider's site if the communications pipeline is too small. "If you can do only 1MB/sec. or 2MB/sec., it could take months or even years to get your data back," says Jeff Treuhaft, co-founder and CEO of Zetta. He says putting in a dedicated connection capable of transferring data in a timely fashion adds about 25% to the cost of Zetta's service.

> "
>
> **JOE MILDENHALL,**
> CIO, APOLLO GROUP INC.

Even if the stored data is accessible, some storage-as-a-service applications, such as Zmanda Inc.'s backup and recovery systems, store data on a third-party platform such as S3 on the back end. So it's important to do due diligence on where and how data is hosted and how to get it back, says Singh. But, he says, that's no different from the checks one should do with any other software-as-a-service provider that stores data.

What's the best way to get started with external cloud storage services? "You have to trust, but verify," Ruth says. That means touring the data center to see what's stored where, creating a service-level agreement with meaningful metrics and performing regular audits to make sure the vendor is living up to them. And if the storage-as-a-service provider is using a third party for the underlying storage infrastructure, you'll need to perform due diligence on that vendor as well.

Despite the challenges, most users see a bright future for cloud storage. Singh says he could see a role for cloud storage for file services if he had to replace his file servers. Others see the cloud as a potential way to back up remote offices.

Mildenhall says he sees a larger role for cloud storage at Apollo as well. "It would be reasonable to put file sharing and e-mail in the cloud," he says. And Mildenhall says he envisions a day when core business data might be hosted in the cloud — as long as he has backups of everything.

Ultimately, Ruth says, IT organizations might use cloud storage as an alternative to building additional data centers to hold copies of critical information. But, he adds, "they need to get over the idea of moving the data off-site." ■

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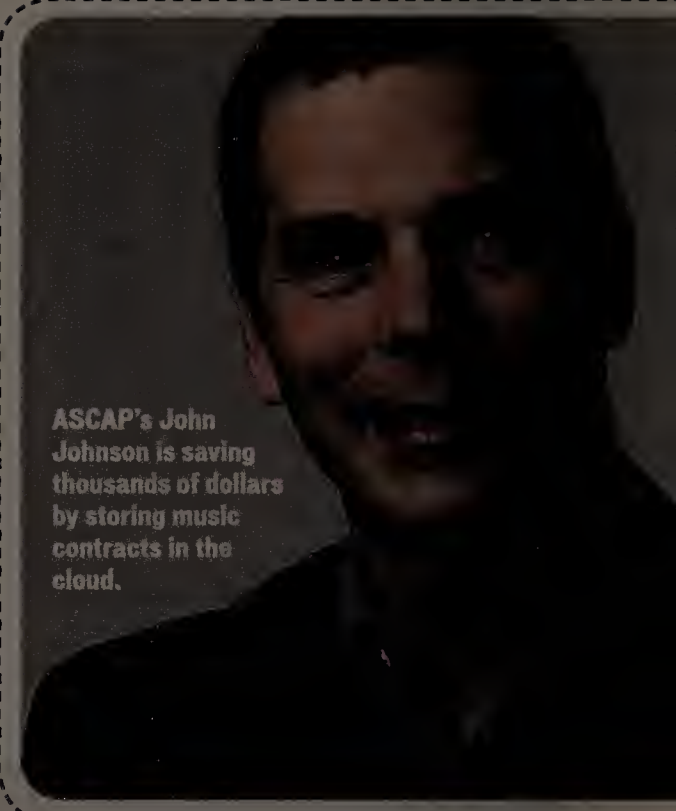
Cash IN THE CLOUD

The **PAY-AS-YOU-USE** scheme helps users **BUDGET** their storage dollars.

BY MARK EVERETT HALL



ASCAP's John Johnson is saving thousands of dollars by storing music contracts in the cloud.

NEXT TIME your local hot spot advertises live music, or your favorite DJ spins a new tune on the radio, it's likely that their contracts to license those songs will be stored in the cloud. That's because last year, the American Society of Composers, Authors and Publishers, which has been licensing artists' and publishers' rights since 1914, moved 91GB of scanned images of signed paperwork into Amazon.com Inc.'s cloud-based Simple Storage Service (S3).

John Johnson, vice president of licensing at ASCAP, says the organization had hoped to use Salesforce.com Inc.'s hosted service to manage and store digitized documents, but it offered very little storage. However, through a service from Appirio Inc. in San Mateo, Calif., he can now use Salesforce.com to manage documents stored in S3. This saves ASCAP thousands of dollars in labor costs, since the old method required manually digging through paper files to find contracts.

Developing cloud storage strategies can be complicated, and there's the nagging issue of security. But according to early adopters, the real silver lining of cloud storage is the savings. Analysts say that moving to cloud-based services can save IT money, because cloud computing involves the use of a shared infrastructure and allows certain costs to shift from capital expenses to operating expenses.

Cost of Amazon's S3 storage per gigabyte per month.

And competition is pushing costs lower, especially for large users. For example, Amazon cut its price for storage of more than 50TB to as low as 12 cents per gigabyte per month, down from 15 cents. And through June, it cut data transfer costs to 3 cents per gigabyte.

One early user, Peter Hedlund, a programmer at Encyclopedia Virginia in Charlottesville, Va., says he's interested in cloud storage because he likes the predictable prices he can get from Zetta Inc., a cloud storage service provider in Sunnyvale, Calif.

Through an affiliation with its parent organization, the Virginia Foundation for the Humanities, Encyclopedia Virginia has been storing primary data on systems in the University of Virginia's main data center, where, as Hedlund puts it, "we're a small fish in a big pond." Ramping up storage quickly was difficult, and he couldn't even get solid quotes on how much the university would charge for storage. Zetta's

VIKTOR KOEN ILLUSTRATION

CALCULATING HIDDEN STORAGE Costs

pricing structure of 25 cents per gigabyte per month "seems reasonable," says Hedlund, noting that now he can not only count on capacity on demand, but he can also accurately budget for it.

However, he adds, "at this point, we can't look to Zetta as primary storage." He says the clear value of cloud storage is as a low-cost archive for Encyclopedia Virginia's countless images and audio and video files. "I like knowing that we have another place [to store] this stuff," Hedlund says.

Cloudize Inc., a collaboration service, uses cloud storage from Nirvanix Inc. in San Diego. The San Francisco-based start-up pays the same rate as Encyclopedia Virginia — 25 cents per gigabyte per month, which Cloudize CEO Edwin Fu says is ideal for planning and budgeting. But he also likes the fact that Nirvanix applies that price to his entire company's online storage use, instead of charging on a per-user basis.

Fu says Cloudize couldn't afford a traditional service from a company like Rackspace Hosting Inc.

KEEPING DATA CLOSE TO HOME

Nick Bali, a senior software engineer at Sony Pictures Imageworks Inc. in Culver City, Calif., is looking into the possibility of building a private cloud using software from ParaScale Inc. His plan is to create a setup that could handle a production environment that requires up to 3,000 servers to process the 50TB to 100TB of data necessary for a single production.

Latency issues make it impossible to put the data into the public cloud, but the advantages of cloud technology — especially low-cost components, virtualization, and the ease of expanding or contracting resources on demand — make the private cloud approach a good fit for Sony, Bali says.

Another user, Iowa Health System in Des Moines, stores "mission-critical" image data on a private cloud managed by software from Bycast Inc., according to CIO Joy Grosser. She says more than 10,000 users are pulling files off of cloud storage systems connected by private networks.

Choice is good. But the dizzying array of cloud storage options and pricing can be daunting. For example, users can snag Amazon's basic S3 storage with a credit card for 15 cents per gigabyte per month or, for applications in the cloud, they can get S3 capacity through third-party services that offer more granular data management tools for about 25 cents per gigabyte per month.

Deals for on-demand storage can also be negotiated directly from cloud storage providers. Or, using proprietary software, users can implement private clouds behind their firewalls; the cost is about the same as for a standard SAN, because the customer's own hardware and software are being used. Another option: Users can adopt hybrid setups, with some data lodged on public clouds and the rest housed in their data centers. That way, the costs are dependent on how the distribution of storage is configured.

Major vendors, too, are adding to the complexity. AT&T, EMC, Hewlett-Packard and Sun Microsystems have all announced online storage initiatives, most of which are barely off the ground, let alone in the cloud. But when they eventually fly, expect higher prices than, say, Amazon's. The big companies are expected to also offer better service-level agreements, management and resources.

Says Mike Feinberg, senior vice president at EMC, "Our focus is on petabytes, not terabytes." ■

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Capacity IN THE CLOUD

IT managers grapple with moving **LARGE STORES** of data into the cloud.

BY STACY COLLETT

JEFF KUBACKI, CIO at Kroll Inc., set a goal for the risk management consulting firm to reduce its storage costs by 25% over the next three years. With some 13 petabytes of stored data to date, Kubacki plans to attack the problem with a mix of tiered storage, business process changes and newer options — including cloud storage.

Though in its infancy, cloud storage seems like an attractive option, with its elasticity, utility-like billing, multiple storage locations and ability to pull data directly from the storage device. But the cloud is still uncharted territory when it comes to sending large chunks of data through the ether.

"Cloud is one of those things that we've been talking to our vendors about to see when it might make sense for us to put our toe in the water," Kubacki says. "We're still just figuring out if it's going to be right for us."

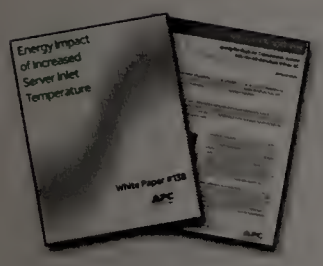
Kroll's IT architects will be investigating ways to migrate about 25% of the risk assessment firm's eligible data through its Internet "pipes" and into the cloud. (The majority of data, mostly legal discovery documents, is considered too sensitive to store in the cloud, Kubacki says.) While storage capacity in the cloud is expandable, limits in the capacity of network connections to the cloud can create challenges for enterprises with multiple petabytes of data to move back and forth.

Percentage of early-adopter organizations that will move to cloud storage in the next year.

Enterprises are asking whether their pipes are big enough to transfer their stored data to the cloud, and often, the answer is no. "The latency is the big inhibitor for what you can use [cloud] storage for," says Adam Couture, an analyst at Gartner Inc. "Right now, for enterprises, we see the [use restricted to] archiving, backup, maybe some collaboration."

But most cloud providers say there are easy ways around capacity issues when migrating data to the cloud — starting with the physical migration of the initial data to the data center location.

It's relatively easy to host and transfer large amounts of data from a day-to-day, user-level perspective, says Rob Walters, general manager of the Dallas office of cloud hosting company The Planet. But moving 20TB to 25TB of data in a chunk continues to daunt current systems. "The networks that we have [today] just aren't good at it. It's just a weak point right now, and everybody is looking at dealing with that," Walters says.



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For enterprises, the "initial ingestion" of backup data to the cloud can be done by copying data to the cloud over a WAN or LAN link, but "that initial backup, depending on how much data you have on your server, could take weeks," Couture cautions.

Doctors' offices that hire Arvada, Colo.-based Nuvolus to create private cloud storage for their sensitive patient data don't like data to be copied and physically taken out of their offices, says Nuvolus CEO Kevin Ellis. So the company requires its health care industry clients to have "a decent Internet connection" — typically 500Gbit/sec. — to transfer the backup data over the pipes, says Ellis. "Depending on the office, we could be looking at pretty long upload times," he says. "You're uploading overnight. We're trying to make sure we're not impacting the doctor's office during the day as well."

PRIVATE PIPELINES

Some vendors also offer private connections established from the enterprise to one of the provider's storage nodes. This is well suited for companies with initial data sets between 2TB and 75TB, or fewer than 750 million files, and where data transfer is time-sensitive, according to Nirvanix Inc., a San Diego-based cloud storage provider. It also works well for one-time and ongoing data migration that requires high throughput and moderate latency.

The other option — most often used by enterprises — is the "sneakernet" approach, where data is physically picked up from the customer on a disk, tape or appliance provided by the cloud storage provider, and taken to the data center for initial backup.

"We've had customers that have shipped storage arrays," says Jon Greaves, chief technology officer at private cloud host Carpathia Hosting Inc. in Ashburn, Va. "In some cases, customers have physically removed disks from the chassis after they have been mirrored, and delivered those."

Nirvanix, for instance, will send its customers storage servers with dual Gigabit Ethernet ports to transfer data within their own facilities. Once the data is transferred, the servers are sent back to Nirvanix and the data is migrated to the cloud.

Early ADOPTERS
WHEN WILL YOUR ORGANIZATION MOVE TO THE CLOUD?
More than a year from now: 29%
Within 4 to 12 months: 41%
Within 1 to 3 months: 24%
Base: 34 respondents who expect their organizations to move to cloud storage

Amazon Web Services LLC supports moving large amounts of data into and out of its cloud using portable storage devices. It uses a high-speed internal network to transfer customer data directly onto and off of storage devices, bypassing the Internet.

Greaves has seen large companies use both the Internet and sneakernet methods for data transfer.

Carpathia builds private clouds for its enterprise customers based on technology from ParaScale Inc. "It depends on how quickly they need to see data up and running, and the use of the data. If it's long-term archiving, it's typically a more gradual migration of data," he explains. "If they need video files for immediate use, and it's tens to hundreds of terabytes, that's the time we start looking at alternative methods."

We're still just figuring out if [cloud storage is] going to be right for us.

After that initial transfer, Internet bandwidth will rebound because only blocks of data that have been changed are added to the backup.

There is no such thing as ultimate scalability or infinite capacity in the cloud, Walters says. It's the provider's responsibility to plan capacity, manage delivery of future storage and stay ahead of demand. "If someone is going to upload 10-plus terabytes [of data], you know about that in advance, and it's a carefully orchestrated exercise," he says.

Storage providers use sophisticated methods for capacity planning. Carpathia, for instance, constantly pushes traffic across its network at about 450Gbit/sec. to 500Gbit/sec. and plans for capacity changes using algorithms borrowed from the telecommunications industry.

"You have a T1 line and have to figure out how many core minutes you can squeeze through that T1 line, which is really an overprovisioning problem," Greaves explains.

Telecom companies also use a unit of measure called an erlang, which describes total traffic volume in one hour, to help determine where they are in the provisioning cycle. "We use exactly the same approach on our cloud," Greaves says. "We can figure out that we're at 1.2, and at 2 we're going to have capacity challenges. So when we hit that 1.2 threshold, that's when we order more hardware."

For Kroll, a cloud storage decision will wait until 2010. "I never like to be on the bleeding edge. [But] I don't mind the leading edge," Kubacki says.

But he adds that cloud storage will still be an attractive option next year. "I think one benefit of moving to the cloud would be the whole concept of it being more of an expense transaction versus a capital transaction," Kubacki. "Today I have a large capital budget; I'm buying my disk and depreciating it over a number of years. So I'm kind of shifting what my P&L looks like by having some of that data in the cloud. I'm not actually buying storage; I'm almost renting it." ■

Collett *is a* Computerworld *contributing writer. Contact her at stcollett@aol.com.*

Consumers IN THE CLOUD

Cloud storage options for consumers offer rich **FEATURES.** Which service is **RIGHT** for you?

BY LUCAS MEARIAN

JOHN CHUNTA had spent four and a half years writing his doctoral dissertation when, two weeks before its expected completion, his laptop's hard drive crashed and he lost the 200-page document.

"The 'blue screen of death' is what the tech guy called it," says Chunta, a cancer researcher. "It was a freak-out moment."

So Chunta bought a new hard drive and installed it in his laptop, then tentatively reinstalled the cloud storage service backup software he'd purchased from Carbonite Inc. just a few weeks earlier. It took close to two days to restore everything, but he was able to rebuild his dissertation.

Chunta, who now has a Ph.D. in anatomy and cell biology, is one of a growing number of consumers who are choosing to use online storage services because they are relatively inexpensive, can automate the backup process and offer massive amounts of ubiquitous storage. But choosing the right cloud storage offering can be tricky: You could end up with a complicated user interface or tools that don't meet your needs.

Online storage services such as Carbonite and MozyHome, which is available through Decho Corp., an EMC company, are designed to provide simple continuous data protection so that each time a file is saved, the changes are replicated to the vendor's data center. But the services available can vary widely depending on the types of features they offer. For example, some can encrypt data in flight or adjust how much bandwidth a backup should use.

PRIVATE VAULT

Do you use a cloud storage service for your own personal data storage?

Yes	30%
No	70%

Base: 166 respondents

Top 12 cloud storage providers:

1	Amazon S3
2	Carbonite
3	Google
4	AT&T's Online Vault
5	Iron Mountain Digital
6	EMC's Mozy
7	iBackup
8	Backblaze
9	Apple
10	JungleDisk
11	SpiderOak
12	Nirvanix

Base: 50 respondents who indicated they use cloud storage service for personal storage.

SOURCE: EXCLUSIVE COMPUTERWORLD SURVEY OF BUSINESS AND IT MANAGERS AT U.S. COMPANIES, JUNE 2009

A MAGNUM OPUS RESTORED

At the prodding of his professor, Chunta had been using CDs and USB flash drives to back up his work, but he admits to being undisciplined and not backing up often enough. Even so, Chunta says he had more than 100 iterations of the dissertation and related research files.

So one day, while listening to a Carbonite ad that had been playing ad nauseam on the radio in his school's laboratory, he decided to try it. Chunta says he couldn't have been more pleased with his experience, particularly because he isn't computer savvy and the service was practically "plug and play."

"Often, we're juggling a lot of different pieces of information, project proposals and grant submissions, and seeing how it all fits together. Having to remember where and how all the data is backed up amounts to mental minutiae," says Chunta, who is on a fellowship at William Beaumont Hospital in Royal Oak, Mich.

Carbonite is among a handful of consumer storage services that are essentially just hard drives in the cloud — simple, no-muss-no-fuss services. And the formula has worked for Boston-based Carbonite. Even through the recession, the company has grown its revenue at least 36% quarter over quarter.

"It's targeted at consumers and small businesses with probably 10 to 50 employees. The idea was simple: Pay $55 a year, and we back up all your data," says Carbonite CEO David Friend.

Many large corporate backup vendors have been immersing themselves in the consumer market as well. EMC Corp. is among the leaders with its MozyHome product, which it added to its product line with the acquisition of Berkeley Data Systems in 2007.

In March, security software vendor Symantec Corp. launched a simple backup service called Norton Online Backup, marketing it as a consumer product for managing up to five PCs on a home network through a single dashboard. The block-level, incremental backups are encrypted both in transit and at rest in Symantec's data centers.

Symantec offers 2GB of online storage for free with its Norton 360 security suite; additional allotments of 5GB, 10GB and 25GB a year can be purchased for $29.99, $49.99 and $69.99, respectively.

Microsoft Corp. entered the fray with its SkyDrive in 2007. SkyDrive is unique in that it is essentially free. While most services offer some free storage — 1GB or 2GB — to whet users' appetites, SkyDrive offers up to 25GB of online storage capacity at no charge; the only caveat is that individual files can't be larger than 50MB. SkyDrive doesn't offer any sophisticated tools, such as incremental backups or encryption. Microsoft makes its money from advertising on the SkyDrive site.

"Think of it as a [flash] drive in the cloud," says Dharmesh Mehta, director of Windows Live product management at Microsoft. Mehta says what will differentiate SkyDrive from other online storage offerings is that it's about to be combined with Microsoft Sync in order to offer not only storage, but also content sharing and collaboration services through the LiveMesh beta.

Through LiveMesh, SkyDrive users will soon be able to share photos and files, and they'll be able to determine the degree of access other users will have to those files. For example, access could be limited to the primary SkyDrive user, or it could be open to a select group of friends or the general online population.

While SkyDrive is moving toward a file-sharing and collaboration model, other online storage and backup service providers see a rich market in just allowing the average consumer to safeguard data. Among the leaders are Box.net and ProSoftnet Corp., which offers a service called iDrive.

And then there are the myriad resellers that use cloud-based storage from third parties. One such reseller is Jungle Disk LLC, which uses Amazon.com Inc.'s Simple Storage Service (S3).

Computer vendors such as Dell, Hewlett-Packard and Toshiba are also bundling online backup services with new PCs and laptops. Such services are available through providers such as Memeo Inc., which also offers its service via direct online sales.

Mozy is the oldest and among the most trusted of the consumer-based online storage services, which is probably one of the reasons why storage giant EMC acquired it. Mozy's service is straightforward — the first 2GB of storage are free, and users pay $4.95 a month for unlimited online capacity. According to Dave Roberson, head of marketing at Mozy, the company has backed up 15 petabytes of data from customers.

"After you initially install it, you don't have to do anything with it. You select which files you want backed up and how often you want them backed up, and it just happens," Roberson says.

Like most others, Mozy's service offers data encryption, but Mozy goes a step further by offering either a public or a private encryption key created by the user. The private key is stored on the user's computer, so if Mozy's data centers were hacked, there would be no key with which the thieves could unencrypt customer data. However, if consumers lose their keys, they also lose their data.

What some may see as a drawback to services like Mozy is that they require software to be downloaded onto a customer's computer. That software can have some complex settings and limit the number of file versions.

SOURCE: SERVICE PROVIDER WEB SITES

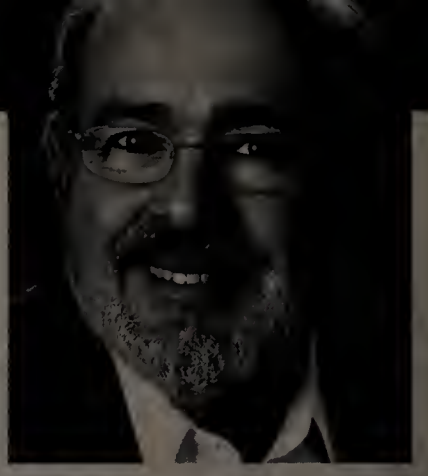
PROVIDER	ENCRYPTED IN TRANSIT?	BANDWIDTH ADJUSTABLE?	PRICE
Carbonite Inc.	Yes	Automated	$55/yr.
EMC's MozyHome	Yes	Manual	$4.95/mo.
Symantec's Norton Online Backup	Yes	Manual	$49.99/yr.
Microsoft's SkyDrive	No	No	Free
Memeo's Memeo Backup	No	Automated	$4.95/mo.

For four years or so, David Albrecht, a computer engineer from Illinois who is working on a master's degree, has used MozyHome to back up about 50GB of data on his MacBook Air laptop, and Amazon's S3 cloud storage service to back up a Linux home server.

"I think of Amazon's S3 as more of a pure cloud offering. I use it for Linux because it's easier to script and I don't think there's a Mozy-like tool available on Linux," he says. "S3 is a high-availability Web service, and Mozy is made for personal backup."

As Albrecht sees it, an external hard drive on his desk would be a security risk. He says he likes that a service will handle not only background incremental backups, but any upgrades or system notifications he may need.

"In four or five years," he says, "I've never had any significant disruption to my user experience on any computer, which is amazing." ■



James Damoulakis

Cloud Storage To the Rescue?

MOST ORGANIZATIONS are being overrun with data — or, more accurately, with the storage required to house and protect the many redundant copies of data that continue to be generated unabatedly.

In these times of cost reduction and consolidation, we must ask ourselves whether there are better ways to manage the glut. Unfortunately, companies have been grappling with this issue for more than a decade. And thus far, the technology options have come up short in addressing the core issues plaguing storage management: unbridled data growth, poor resource utilization and ineffective planning. The latest technology with promise is cloud storage. Will it work any better than the others?

Thinking back to the early days of SANs, one of the primary justifications for moving away from siloed direct-attached storage in favor of storage arrays and SAN infrastructure was the promise of greater efficiency through improved resource utilization. While SANs might have brought other benefits, such as improved availability and recoverability, utilization continues to be less than optimal in many environments.

The next big initiative was information life-cycle management. By devising a strategy for storage allocation and distribution based on the business value of data, the theory went, we could reduce quantities of expensive high-end storage and thereby shrink costs. The result: A lot of organizations bought additional tiers of storage, but not a lot of savings materialized — at least not nearly the amounts anticipated.

A more recent technology enhancement is thin provisioning, which although promising remains a somewhat niche technology because of current application and operating system constraints. Another is data de-duplication, which was designed primarily to achieve a more favorable cost point for disk backup compared with tape. Both thin provisioning and data de-duplication will help drive storage efficiency in the future.

■ Like a diamond, a piece of data, once created, is forever.

POLICY FAILURES

Let's not lose sight of the fact that at the same time organizations have been struggling with storage efficiency issues, the cost of an actual device to store data has continued to fall, and fall fast. So why is it so difficult to get our arms around this problem?

To a large extent, the answer lies in the continued lack of comprehensive storage management policies — and data management policies — within most organizations. That problem is exacerbated by the lack of metrics and reporting about data and storage usage, and trending. Consider, for example, the purging of data. Like a diamond, a piece of data, once created, is forever. It is typically stored, backed up, replicated and, perhaps, archived (all of which require more storage). But the likelihood that it will actually be purged is very low.

Interestingly enough, the sad state of storage management might represent a significant opportunity for cloud storage. The cloud could serve as a secondary or, more likely, tertiary tier of storage. Data — mostly unstructured — could then be relegated to the cloud, either manually or with an automated data mover based on aging and access policies. In addition to freeing up capacity and slowing the rate of equipment acquisition, this data would no longer need to be backed up or replicated, so the multiplier effect would be eliminated. Furthermore, if cloud service providers are truly service-oriented, they might well provide more-comprehensive service-level agreements and reporting metrics on this data than is available internally.

Clearly, moving data into the cloud isn't something to be undertaken lightly. There is much to consider, including security, availability, access and control. And it's important to keep in mind that although the cloud might offer attractive pricing for some classes of data, to drive more systemic changes in cost, cloud storage must be accompanied by a well-formulated storage and data management strategy. ■

James Damoulakis *is chief technology officer at GlassHouse Technologies Inc., an IT infrastructure consulting and services firm.*

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National average for all industries	8.4%
Database administrators	6.1%
Computer scientists and systems analysts	5.7%
Network systems and data communications analysts	5.4%
Computer support specialists	5.3%
Network and computer systems administrators	4.3%
Computer software engineers	4.2%
Computer and information systems managers	4.0%

SOURCE: U.S. BUREAU OF LABOR STATISTICS

JOBS BY GENDER

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The technology positions held most frequently by men and women.

WOMEN		MEN
Business analyst	1	IT management*
Project manager	2	Systems administrator
Quality assurance tester	3	Software engineer
Programmer/analyst	4	Project manager
Developer, applications	5	Programmer/analyst

*Includes CEO, CIO, CTO, vice president, strategist and architect

SOURCE: OICE'S 2008-09 TECH SALARY SURVEY, APRIL 2009

PAGE COMPILED BY JAMIE ECKLE.

■ Q&A

Dave Willmer

The executive director of **Robert Half Technology** discusses finding a job in a deep recession.

How is IT holding up in the downturn? Companies are downsizing, but IT has been more resilient than other areas. In fact, the unemployment rates for many positions within IT are significantly lower than the national average. [See chart at left.]

In our quarterly Robert Half Technology IT Hiring Index and Skills Report, 8% of CIOs polled said they plan to expand their IT departments in the second quarter. Those that plan to hire cited reasons such as the increased need for customer/end-user support, rising workloads, corporate growth or expansion, and system upgrades. CIOs planning to reduce staff said the primary reasons are reduced IT budgets, postponed IT projects and company-wide layoffs.

When companies are doing mass layoffs, it's even more difficult than usual to find another job. What can help? A good way to jump-start your search is to reach out to members of your professional network. Be specific about the skills you can offer and the type of position you seek to give people a better chance of helping you. Candidates should take a high-touch and high-tech approach to networking. Be active at industry, business and community events, and explore online professional and social networking avenues like LinkedIn and Facebook to track down job leads.

Make sure you update your résumé, and not just with details of your last job. Look at it from top to bottom to determine if it needs a complete overhaul. Employers want to see the quantitative results you've helped a company achieve, whether it's saving time or money, or improving IT efficiencies.

Another good way to double up your job search effort is by registering with a specialized staffing firm. They often can open doors to opportunities that haven't been advertised. You can build skills and earn money by taking on project assignments, many of which can turn into full-time roles.

Do you foresee a lot of people leaving the industry? IT is actually one of the safer professions to be in now and for the longer term. IT jobs continually beat the national unemployment average and post some of the lowest unemployment rates in the country, according to the Bureau of Labor Statistics. While many companies have downsized, they are experiencing rising IT workloads. And as the economy turns around, there will likely be pent-up demand for IT projects that were put on hold. While I don't foresee a large number of people leaving the IT industry for this reason, some may consider switching directions within the field.

For example, we recently surveyed 1,400 CIOs about their technology investment plans for 2009. Seven out of 10 said their companies will invest in IT initiatives, and information security topped the list, with 43% of the response. This was followed by virtualization (28%) and data center efficiency (27%). VoIP (26%), software as a service (26%) and green IT (20%) rounded out the top six investment areas. Job seekers may have greater opportunities in these areas, as long as they keep their skills current – whether it's on the job, through project or volunteer work, taking online classes or achieving a professional certification.

– JAMIE ECKLE

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SharkTank

TRUE TALES OF IT LIFE AS TOLD TO SHARKY

Who D'ya Trust?

A remote site at this company has a server that needs a little extra supervision, so a pilot fish is asked to write a script that can make sure it's up and operational. "After working on the code, I tested it," fish says. "It said the server was down. I spoke to the management, who insisted the box was up and it must be my script." Fish tests the script against 15 other servers that he knows are working properly. The script's results confirm that those servers are all up and operational. So why won't it work with the remote-site server? "We sent somebody to the remote site to check the server," fish says. "Forty-five minutes later, he confirmed that the server had actually crashed because it had overheated. We don't know when it crashed or how long it was down, since nobody had noticed or complained. We quietly rebooted the server and confirmed that the script could then see it. I guess I should believe my own coding sometimes."

Aw, Go On, Guess

This project manager pilot fish and his cohorts report to a guy with a very specific technique for raising issues. "This mid-manager was recruited and put in place to take the load off our *real* boss," fish says. "He would send us spreadsheets, word processor documents and live links from our company Web site with the question: 'So, what do you think is wrong with this?' " And the result is always the same. "It was hilarious," says fish. "At least four of us would print the e-mailed info and then show up at his office to tell him that we needed to know what *might* be wrong, and that we couldn't just plug in a crystal ball and hope to find the answer to his very vague question. We wasted more time trying to figure out the question than fixing the problem, if any was found. Last we heard, he had a lab, an office, a fax and a PC – and he isn't a people manager anymore."

Starting With a Bang

It's more than a few years back, and it's also the first day working in IT for this pilot fish in the U.K. "I was watching an operator show a group from senior management around the new computer," fish says. "He pointed out the new 1GB hard disk – the size of a washing-machine drum. It lived in its own rack and was the latest technology at the time. He proceeded to open the door to show the management this new and wonderful disk that would reduce processing times – and the door fell off with a loud bang. For a moment, there's a stunned silence. Then a voice pipes up from somewhere in the computer room: 'It's OK, only the cabinets are made in England. The rest of it is Japanese and more reliable.' "

■ *Sharky relies on you for true tales of IT life. Send yours to sharky@computerworld.com. I'll file off the identifying marks, and you'll score a sharp Shark shirt if I use it.*

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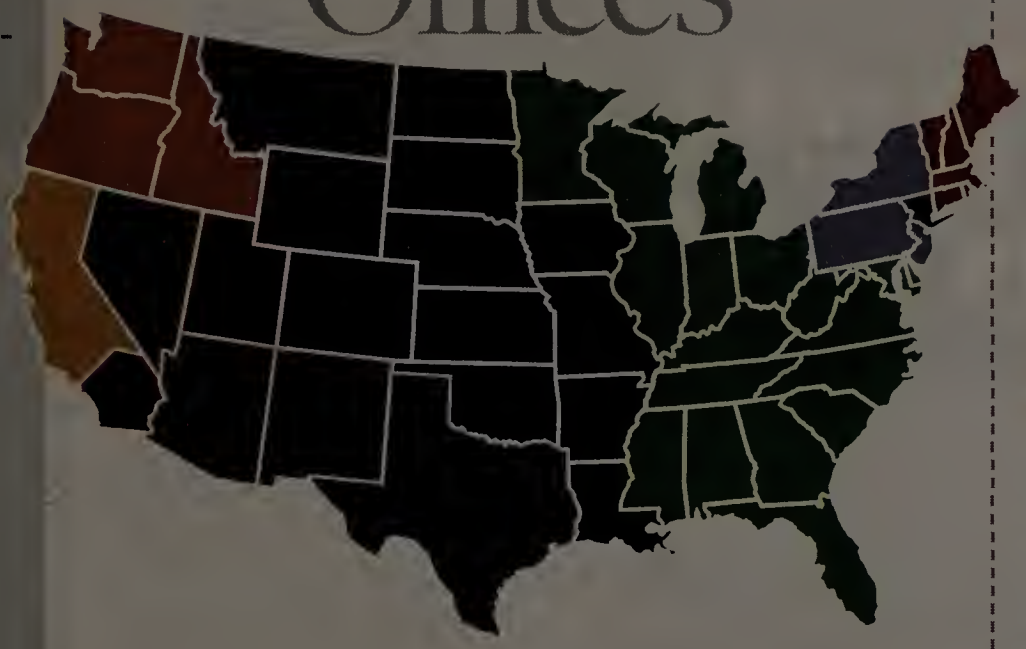

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■ OPINION

Thornton A. May

The Three Paths To Mobile Victory

MOBILITY MATTERS. It matters to our commander in chief and your employees. It matters to the executives at the top of the house and the managers in the middle. It matters to your customers. Mobility is emerging as the new make-or-break test of CIOs. Do it right, and you can be a hero. Do it wrong, and you run the risk of becoming an on-the-way-out-the-door dog.

In some ways, mobility is like the weather, but a lot more interesting. Everyone experiences it, and we all have an opinion about it. Like the weather, it can be a great conversation starter — "Hey, what kind of phone is that?" But what makes mobility interesting goes well beyond the latest downloadable apps for the hottest new smartphones. Part of that interest stems from mobility's growing importance for our users, and part of it comes from the looming question of just how we as IT leaders are going to address those users' mobility needs.

It's the question of the moment. Many in the underground press of the technology industry — the blogs, e-newsletters and white papers — have labeled this the Summer of the Smartphone. Microsoft CEO Steve Ballmer found mobility compelling enough to show up at Mobile World Congress in Barcelona, where in the course of an interview, he uttered an understatement for the ages: "Strategically, phones are very interesting."

So, what do you do about mobility? I see three possible routes, which I'll label BYOD, Bespoke and Bauhaus. Many IT executives find themselves at the pointy end of the mobility spear. We are at a critical decision point. CIOs are torn between the macroeconomically induced mandate to materially manage costs down and the simultaneous need to keep up with — if not anticipate and lead — constituent-driven demand for lightweight, high-design, easy-to-use, secure, very-short-life-span, works-anywhere-in-the-world portable devices and services.

■ Many IT execs find themselves at the pointy end of the mobility spear.

BYOD stands for "bring your own device." In this scenario, IT gets out of the mobility provisioning business altogether and simply accommodates user device choice. Of course, guidelines have to be issued, so that users equip themselves with devices that meet the organization's security needs. This strategy has been brilliantly deployed by CIO Robert Rennie of Florida State College at Jacksonville, and several university campuses around the world are following suit.

The Bespoke approach, as the name implies, requires more careful tailoring to users' needs. IT becomes a mobility boutique, providing customized device deployments to selected knowledge workers. Such extreme personalization would have to be reserved for the employees who would generate the best return on the investment.

The third path involves IT lowering the boom on mobility choices and dictating with absolute authority the lowest-common-denominator devices to be used. I borrowed the Bauhaus label from my good friend and mentor Bruce Rogow, who uses the term "Bauhaus IT" to describe a stripped-down IT that has much in common with the Bauhaus school of design of the early 20th century, with its simplified, clean lines in the design of housing meant to be affordable by the masses.

Recently, Hewlett-Packard's Mark Hurd told an appreciative audience at the Conference on California's Future, "Show me a bad IT organization, and I will show you a bad CEO." That's a very intriguing statement. I would add the corollary, "Show me a bad mobility strategy, and I will show you a bad CIO."

That's something you can't afford. Choose a path and set things in motion *now.*

IT has evolved well beyond the days when we ran applications on a bunch of boxes. Without a coherent mobility strategy, you risk looking like you haven't kept pace. ■

Thornton A. May *is a longtime industry observer, management consultant and commentator. You can contact him at thorntonamay@aol.com.*

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